Homework 4 – Due 4/27 at 9 AM Eastern Time

1. Three persons A, B and C have applied for a job in a private company. The chance of their selections is in the ratio 1 : 4 : 2. The probabilities that A, B and C can introduce changes to improve the profits of the company are 0.4, 0.5 and 0.6, respectively. If the change does not take place, find the probability that it is due to the appointment of C.

2. Consider a statistical experiment where we model a game consisting of drawing two types of coins from a bag (with replacement) for a total of four possible outcomes. The state space or sample space Ω of this experiment is then ($, $), ($, ￡), (￡, $), (￡, ￡). Let us assume that the composition of the bag of coins is such that a draw returns at random a $ with probability 0.4. What is the probability that a $ is drawn one time?

3.

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a. What is the probably of if P(A) = 0.1, P(B) is 0.2 and the probability of ?

b. What is P(A|B)?

c. What is P(B|A)?

4. Four people are tested for presence of antibodies for a particular disease, and we expect the antibodies to have a 1/10 probability of occurrence in each person. What is the probability of at least three individuals being tested before one of them is found to have the antibodies?

5. Given the following dataset, calculate the following if the Target Variable is the Temperature:

A table with different types of temperature

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1. Entropy for the Target Variable
2. Entropy for both attributes
3. Information Gain for both Attributes
4. Should outlook or humidity be the first node in a decision tree?